

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

THE REA LINEMAN

RURAL ELECTRIFICATION ADMINISTRATION

U. S. DEPARTMENT OF AGRICULTURE

Vol. IV. No. 7

August, 1944

St. Louis, Mo.

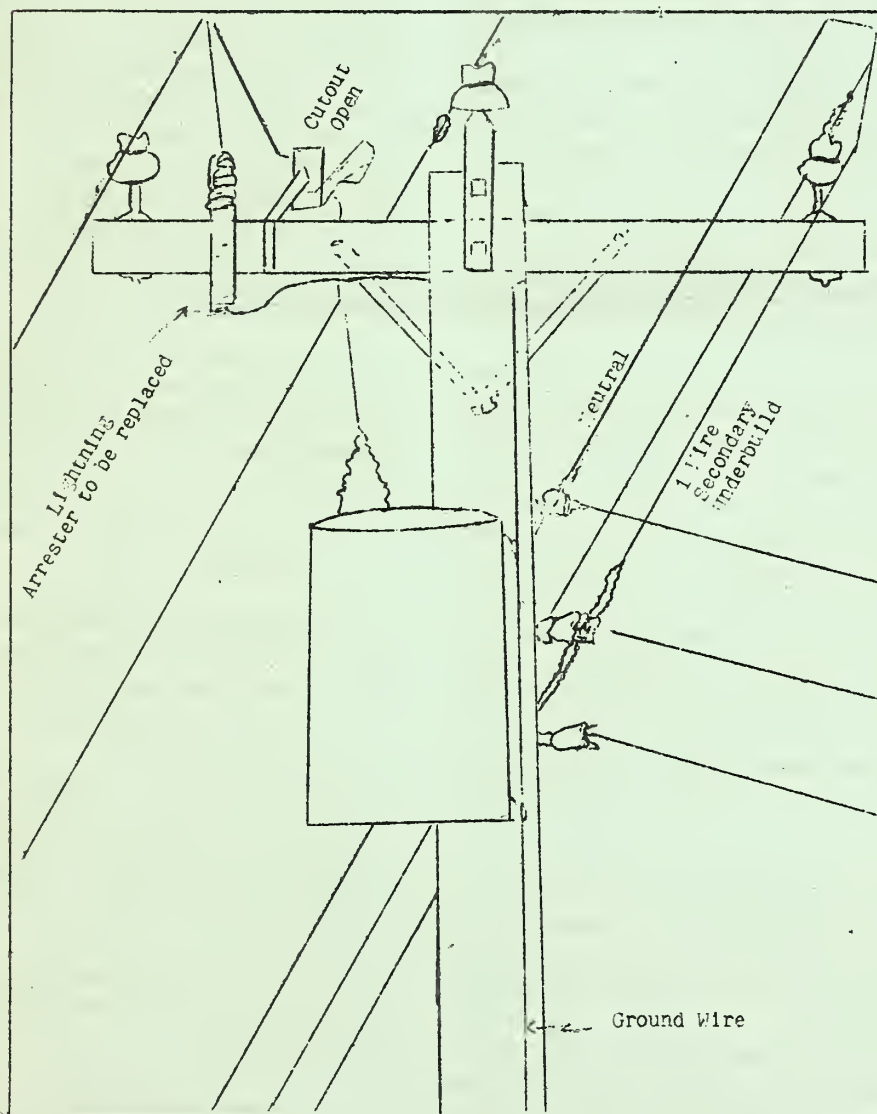
LINEMAN RESUSCITATES AT POLE TOP

Two linemen and a groundman were replacing lightning arresters on a 3-phase line running north and south at conventional transformer stations. One arrester had already been replaced, and the second location, approximately two and one-half miles from town, was a tangent 35, class 6 pole with one wire under-built secondary north and south and 3-wire service east and across the road. The transformer was located on the field side and southwest quarter of the pole.

"Buck" and "Joe" climbed the pole. "Buck" disconnected the transformer at cut-out, then changed

his position on pole, placing his left foot on top of transformer with right climber in pole between transformer and neutral. For some unknown reason, he reached up into the middle phase, contacted it with the inside of his left arm at the elbow. "Joe" was working just below the secondary on the north side of the pole, preparing to receive hot line cutters to remove jumper from arresters. Hearing the noise of an arc, "Joe" looked up and saw "Buck" fall from the center phase and strike the field phase with his head. "Buck" slumped backward in his belt over the transformer. "Joe" dropped the cutter, went around and up the pole, and administered pole-top resuscitation. Within five minutes "Buck" had regained consciousness and "Joe" brought him down the pole on his belt after cutting the primary lead from the cut-out to the transformer.

The groundman had notified the Co-op manager, who in turn had the ambulance and necessary first aid on the scene by the time "Joe" had "Buck" conscious. "Buck" was delivered



Published Monthly in the interest of Safety
for Employees of REA Systems

David A. Fleming, Editor

ACCIDENT CYCLES

We often hear the expressions, "Accidents run in cycles," and "It never rains but it pours." In certain respects these expressions are quite true. An occasional accident is not particularly noticeable, but when they are piling up, additional small ones become noticeable and aggravating.

Talk of accidents in cycles reminds us of a scythe or cradle cutting on the down stroke and swinging back for a new cut. When accidents occur "on the down stroke"—in a rush—they are alarming. We buy protective equipment, and order our men to be careful.

Eventually these orders, together with safety precautions, rubber gloves and protectors, hot sticks and line maintenance tools, have their effect. Our concern and alarm is carried over to the men doing the job. Accident frequency drops.

Too often, when that happens, the "heat" goes off. The scythe starts on the back swing and caution falls away. This is the crucial time—the time to hold back the scythe from another cutting blow at the hands, feet, eyes and lives of our men.

How to do this? In theory it is easy. Hire a good man; see that he has experience before being given a job requiring skill; that he wears and carries protective devices; has sufficient help. Warn him of the dangers; tell him exactly what to do; how to do it and see that he does it.

But in these times it is difficult to get the man we want. We may be able to hire an experienced worker and break him in with the proper tools and the proper guidance. On the other hand, we may have to hire a man fresh off a farm or out of a grocery store.

The new worker may seem capable, bright, able to catch on easily and willing to work. At first everything goes well. So after awhile, because of the urgency of a certain job and for lack of more experienced men, we may let him take on jobs for which he does not have the proper experience and training. One day we may send him on a particularly hazardous job, with confidence that he can handle it correctly and safely. Then the trouble begins. We know by experience that a great many men do not do what they are told—perhaps because they are not good listeners, perhaps because our orders were not clear to them. But more likely, because we have taken for granted that new workers know more than they actually do.

The best protective equipment is of little use if a man does not understand clearly just when and where to apply it; how to keep it in good repair and the importance of having it on hand for emergencies. The most carefully-worded warning about the dangers of high lines means nothing if the man has not been trained to keep his distance from energized lines.

The REA Safety and Job Training program aims to train men to work our way—the safe way. It trains them to perform the jobs we want done in the way we want them done. It trains them to do a better quality of work, to do it safely, thereby protecting the cooperative, the members, fellow employees, and themselves.

RESUSCITATION

(Cont'd. from page 1)

to the hospital within 30 minutes after the accident happened. Injuries received were burns on the left side of forehead and face, inside of left arm at the elbow, right and left legs below the knees, and the right foot at instep and toes.

DISCUSSION:

If this voltage had been 2,300, the primary could have been covered up with rubber protective equipment, line hose, hoods and blankets, and a lineman could have changed this arrester safely. But this voltage was more than 3,000 volts to ground, and rubber protective equipment cannot be applied and used safely on this voltage — a lineman must get too close to the primary to apply protective equipment and he is not safe after he has the line covered — the voltage is too high.

In cases where arresters have been mounted on the primary arm and occasion arises to change them, we can do one of two things —

- 1 - De-energize and ground the line.
- 2 - Furnish hot-line tools; see that they are used and allow the time to do the work safely.

We believe the best procedure is to keep arresters, cut-outs and oil circuit breakers down where a lineman can work them safely. He then has no reason to climb up too high on the pole. We base our belief on REA accident experience records.

Lineman "Joe" did a nice job of pole-top resuscitation. He has our congratulations.

THE ACCIDENT: A lineman with hot stick attached to his belt climbed the transformer pole on the "clear" side and buckled his safety belt just below the three-wire service. He discovered that the jumper, which was connected to the 7.2 kv primary with a hot tap clamp, was loose and causing most of the interference at the house served by this transformer. With both hands holding the 4' disconnect pole, he attempted to tighten the clamp. Due to his position on the pole, it was necessary to reach as high as he could, which placed his hands between the transformer bushing and the pole. A hard gust of wind caused him to lose his balance temporarily and, with an involuntary movement of his left hand to regain his balance, he contacted the 7.2 kv jumper with the back of his left hand and the case of the transformer with his left arm about eight inches above his hand. He climbed down the pole and applied foille and bandages to the burns.

He received first degree burns on the back of his left hand and on his left arm about eight inches above his hand. He was wearing a pair of leather-palm, cloth-back gloves and had his sleeves down.

THE INVESTIGATION: 1. A short time before, this transformer was disconnected to change the construction from dead end to straight line when the rural line was extended. The hot tap was not tightened sufficiently at that time to insure good contact.

2. The injured was using a four-foot hot stick for tightening the clamp on a 7.2 kv conductor.

3. The jumper to this transformer was threefeet six inches long, which made it almost impossible for injured to keep his hand below the level of the top of the 7.2 kv bushing.

4. The distance between the pole and bushing was not sufficient for a man to work safely.

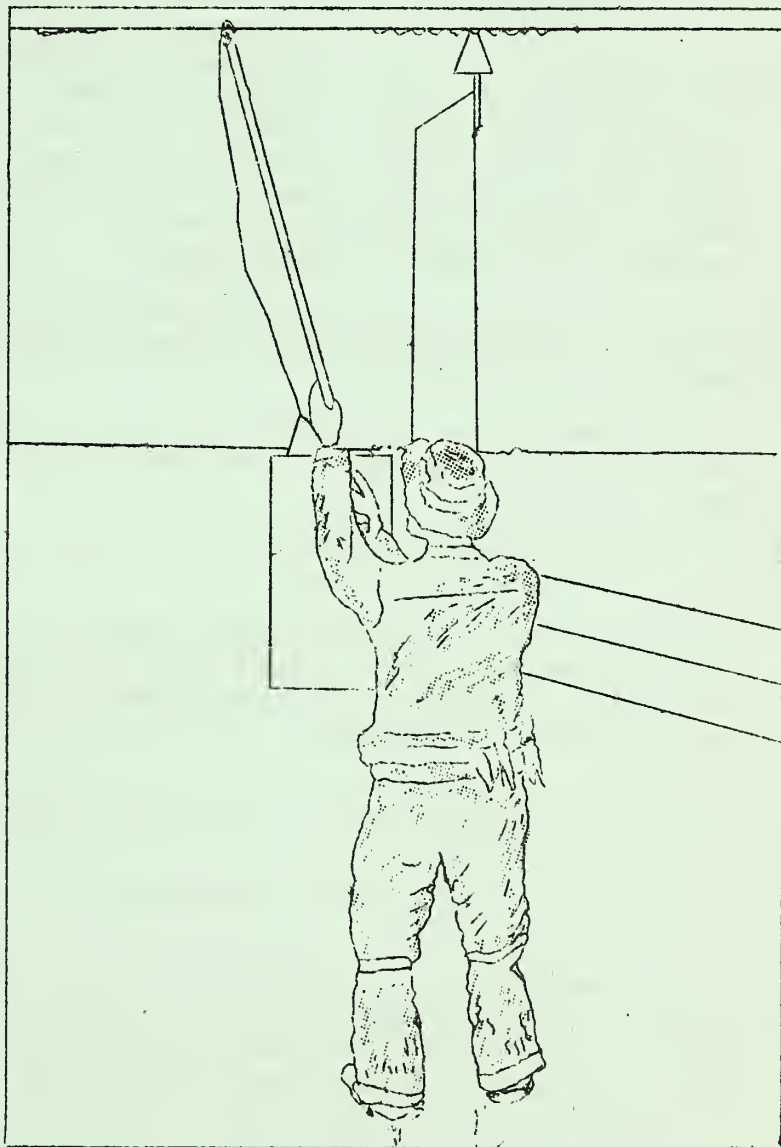
5. He was not wearing rubber gloves.

THE CONCLUSION: 1. The primary cause of this accident was "using improper tools" in that the hot stick was not of sufficient length.

2. A standard 8-foot disconnect stick should be used for work on 7.2 kv lines.

3. Wear your rubber gloves on all poles carrying energized circuits.

This was not a co-op accident but we may gain from the experience of others.



DISCUSSION CASE

REPORT: "One of our linemen attempted to re-fuse a 3-shot cut-out and came in contact with some energized part of the 3-shot with his right hand. His left leg was touching a guy wire. He received an electric shock, lost consciousness and slipped down the pole. A groundman applied artificial respiration, which we think saved the lineman's life.

"The line was out of service but one of the tubes had failed to kick out of the unit. The lineman attempted to take this tube out with his hot stick but was not successful. He evidently reached up with his hand and tried to dislodge the tube. I am sorry to say that he was not wearing rubber gloves when the accident occurred."

DISCUSSION: This case points out the necessity that rubber gloves be worn on all poles carrying energized circuits. It also indicates the necessity of wearing rubber gloves when using hot sticks. So many REA experience accident record reports read along these lines: "He did not intend to go higher on the pole." "He was not in position where he needed gloves." "He was using an 8-foot stick and did not need rubber gloves." "He forgot the line was hot." "He slipped and grabbed the hot primary." "A hot wire fell down across his hand."

IT COULD HAPPEN TO YOU:

1. A dead-end pole equipped with transformer, service and service guy was being converted for a tap connection. The lineman, who had been drinking, was wearing rubber gloves, but refused to follow the groundman's advice to use a hot stick, nor would he permit the groundman to work on the pole. In cutting the service guy, he bent back one strand at a time with his thumb and, while connecting the tap jumper a flash occurred, severely burning his right thumb and heel. The right glove had been punctured and not noticed. The superintendent reports that the lineman is no longer employed by the cooperative.

2. As two men used a cross-cut saw to remove a 10-inch, V-shaped limb from a felled tree, the limb broke and bounced violently on one employee's leg, cracking a bone.

3. A lineman was sawing a limb from a tree. The limb broke and threw the saw against the lineman's mouth, cutting his lip. No time lost.

4. A lineman strained the lower part of his back as he tried to lift a large rock out of a pole hole.

5. A maintenance man climbed a 35-foot junction pole to re-energize a tap-line after repair of storm damage. In the act of safetying off, his left hand touched a hot wire; the current went out his right hand. THE BURNS WERE ON THE HANDS. He fell unconscious, but was resuscitated.

6. Manager inspecting wiring. Trap door fell on fingers; bruised and lacerated fingers. No time lost.

7. Lineman lifting wire over cross-arm strained back. No time lost.

8. Lineman blasting pole hole, using fuse and cap. Dynamite did not go off. After a two-hour wait, lineman again loaded hole with another charge and fired the second shot but first shot did not go off. After a ten-minute wait, lineman kneeled over hole, picking and pushing loose gravel, when the first shot exploded. Dirt and gravel driven into face and eyes. 12 days lost.

We do not believe that this man would have been burned had he been wearing rubber gloves. We do not recommend that a man take hold of a cut-out with rubber gloves, because rubber gloves are not made to withstand more than 3,000 volts to ground. But they are certainly far more protection than leather gloves. The presence of rubber gloves on the hands serves as a reminder that you are working near energized circuits. When we practice the wearing of rubber gloves on all poles carrying energized circuits, we form the habit of having those gloves on the hands when the unexpected occurs. We do have that much protection, and in most cases the protection will prove ample.

83% of REA electric shock accidents show burns on the hands. Should we not recommend that the hands be protected? If these burns were appearing on the head, should we not recommend that insulated hats be worn.

The position on the pole could to a great extent accomplish the same purpose as wearing rubber gloves, but REA accident experience records have taught us that linemen will not maintain that safe position. The answer must be, "wear those rubber gloves!"